Recipe for Science

Sweet Science of Surface Area

Ingredients:

Root beer
Vanilla ice cream
Tall glasses
Straws and iced tea spoons

Procedure: We are going to make an ice cream float.

Experiment:

What happens if you . . .

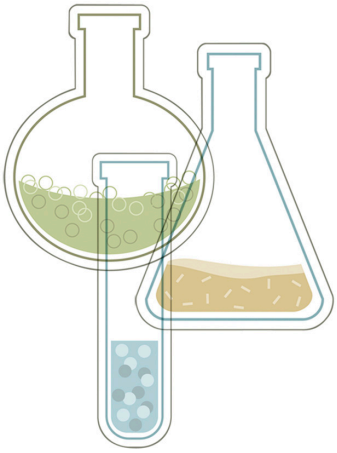
1. Put the ice cream in the glass before adding the root beer?
2. Put the root beer in the glass before adding the ice cream?
3. Compare the soda in the float with soda from the bottle?

Try some experiments of your own!

—Different kinds of soda or ice cream
—Shapes of glasses
—Warm or cold root beer

What do you think?

In what order do you prefer to make your ice cream float?



What is happening?

Root beer is carbonated by dissolving carbon dioxide gas in the water. While it is still in the capped bottle, the CO_2 is kept in solution by pressure. Once we open the bottle a number of factors control whether the gas fizzes out or stays dissolved:

- **Temperature**—cold water holds more gas in solution than warm water.
- **Surface area and roughness**—bubbles tend to form on surfaces; particularly on rough surfaces.
- **Agitation**—shaking will encourage bubble formation.

Ice cream contains a lot of air bubbles. On a very fine scale, the bubbles increase the surface area and roughness of the ice cream. It also has chemical agents to thicken it. Some of these chemicals will enter the root beer and affect the bubbles.

Think about the differences between pouring root beer over ice cream and placing a scoop of ice cream into a glass of root beer. Which one will excite more bubbles? Which one will dissolve more thickeners from the ice cream? How do you like your foam; thick and heavy, or light and effervescent?

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